

LIST OF CONTENTS

Number 1

R. R. Wehe and A. W. Westerberg	1 A bounding procedure for the minimum number of columns in nonsharp distillation sequences
C. A. Romero and R. H. Davis	13 Transient model of crossflow microfiltration
W. L. Kubic, Jr	27 The stability of metal-water reactions
D. G. Allen and C. W. Robinson	37 Measurement of rheological properties of filamentous fermentation broths
J. O. Valderrama, L. A. Cisternas, M. E. Vergara and M. A. Bosse	49 Binary interaction parameters in cubic equations of state for hydrogen-hydrocarbon mixtures
M. L. Hunt and C. L. Tien	55 Non-Darcian flow, heat and mass transfer in catalytic packed-bed reactors
I. Celik, T. J. O'Brien and D. B. Godbole	65 A numerical study of coal devolatilization in an entrained-flow reactor
S. Ghosh and V. S. Patwardhan	79 Aqueous solutions of single electrolytes: a correlation based on ionic hydration
J. Skrzypek, M. Lachowska and D. Serafin	89 Methanol synthesis from CO ₂ and H ₂ : dependence of equilibrium conversions and exit equilibrium concentrations of components on the main process variables
T.-B. Liang and M. J. Slater	97 Liquid-liquid extraction drop formation: mass transfer and the influence of surfactant
S. Farooq and D. M. Ruthven	107 A comparison of linear driving force and pore diffusion models for a pressure swing adsorption bulk separation process
P. A. Aguirre, E. O. Pavani and H. A. Irazoqui	117 Optimal synthesis of heat-and-power systems with multiple steam levels
D. D. Frey	131 The entropy condition for the dynamics of nonlinear multicomponent sorption in porous media
A. W. Marczewski, A. Derylo-Marczewska and M. Jaroniec	143 A simple method for describing multi-solute adsorption equilibria on activated carbons
R. D. Holstvoogd and W. P. M. van Swaaij	151 The influence of adsorption capacity on enhanced gas absorption in activated carbon slurries
H. Siddiqui and M. Sahimi	163 Computer simulations of miscible displacement processes in disordered porous media
G. F. Versteeg, J. A. M. Kuipers, F. P. H. van Beckum and W. P. M. van Swaaij	183 Mass transfer with complex reversible chemical reactions—II. Parallel reversible chemical reactions
Li Jianmin, Wang Shaokun and Shi Jun	199 Flexibility, multiplicity and symmetry of Wilson parameters and vapor-liquid equilibrium in multicomponent systems

P. Arteaga and U. Tüzün	205	Flow of binary mixtures of equal-density granules in hoppers—size segregation, flowing density and discharge rates
J. A. Schonberg, D. A. Drew and G. Belfort	225	A neutrally buoyant sphere in creeping flow between parallel plates: farfield velocity profiles
T. Westerlund and T. Salmi	237	Factorization of reaction systems applied to catalytic reactions
K. Warmuziński and J. Buzek	243	A model of cellular convection during absorption accompanied by chemical reaction
A. R. Khan and J. F. Richardson	255	Pressure gradient and friction factor for sedimentation and fluidisation of uniform spheres in liquids
M. Grzesik, J. Skrzypek and B. W. Wojciechowski	267	The catalyst decay behaviour in fluidized-bed reactors using the time on stream theory
H. M. Backes, J. J. Ma, E. Bender and G. Maurer	275	Interfacial tensions in binary and ternary liquid-liquid systems
B. J. Hwang and T.-C. Chou	287	Bias temperature effect on the characteristics of a heterogeneous-homogeneous chain reaction in a semi-batch annular-wall reactor
J. Moiola, M. C. Colantonio, A. Desages and J. Romagnoli	297	Bifurcations and degeneracies in a CSTR with reactions $A \rightarrow B \rightarrow C$: frequency domain analysis
K. R. Westerterp and E. J. Westerink	307	Safe design and operation of tank reactors for multiple-reaction networks: uniqueness and multiplicity
E. J. Westerink and K. R. Westerterp	317	Stable design and operation of catalytic fluidized-bed reactors for multiple reactions: uniqueness and multiplicity
E. J. Westerink and K. R. Westerterp	333	Safe design and operation of fluidized-bed reactors: choice between reactor models
J. Y. Day, H. Littman and M. H. Morgan III		<i>Shorter Communications</i>
M. A. Soliman	355	A new choking velocity correlation for vertical pneumatic conveying
V. M. H. Govindarao, M. Subbanna, A. V. S. Rao and K. V. S. Ramrao	360	On the solution of the collocation method equations
	362	Voidage profile in packed beds by multi-channel model: effects of curvature of the channels

Number 2

T. R. Blake, H. Webb and P. B. Sunderland	365	The nondimensionalization of equations describing fluidization with application to the correlation of jet penetration height
R. O. Fox and J. Villermaux	373	Unsteady-state IEM model: numerical simulation and multiple-scale perturbation analysis near perfect-micromixing limit
J. I. Morell, N. R. Amundson and S.-K. Park	387	Dynamics of a single particle during char gasification
E. Gall and W. Kast	403	Kinetics of sulphur dioxide sorption by single pellets of activated carbon

D. D. Joseph	411	Generalization of the Foscolo-Gibilaro analysis of dynamic waves
W. Bujalski, A. W. Nienow and Liu Huoxing	415	The use of upward pumping 45° pitched blade turbine impellers in three-phase reactors
D. H. Cho, D. R. Armstrong and L. Bova	423	Experimental study of reacting gas jets in liquids: heat release effects
H. Hikita, K. Ishimi and S. Koroyasu	437	Gas desorption from falling liquid films in entrance region of inclined wetted-wall columns with an overflow-type distributor
M. Goto, J. M. Smith and B. J. McCoy	443	Parabolic profile approximation (linear driving-force model) for chemical reactions
V. Jiříčný and V. Staněk	449	Transients of the hydrodynamics of counter-current packed-bed columns
G. W. Stevens and M. H. I. Baird	457	A model for axial mixing in reciprocating plate columns
R. Banerjee, K. G. Narayankhedkar and S. P. Sukhatme	467	Exergy analysis of pressure swing adsorption processes for air separation
G. Buzzi-Ferraris, P. Forzatti and P. Canu	477	An improved version of a sequential design criterion for discriminating among rival multiresponse models
Y. Deng and M. Kwauk	483	Levitation of discrete particles in oscillating liquids
S. S. E. H. Elnashaie, A. M. Adris, A. S. Al-Ubaid and M. A. Soliman	491	On the non-monotonic behaviour of methane-steam reforming kinetics
H. J. Viljoen, J. E. Gatica and V. Hlavacek	503	Bifurcation analysis of chemically driven convection
C. C. Lakshmanan and O. E. Potter	519	Numerical simulation of the dynamics of solids mixing in fluidized beds
S. Ichikawa	529	Volcano-shaped curves in heterogeneous catalysis
H. I. Andersson and F. Irgens	537	Hydrodynamic entrance length of non-Newtonian liquid films
W.-T. Tang and L.-S. Fan	543	Axial liquid mixing in liquid-solid and gas-liquid-solid fluidized beds containing low density particles
S. S. Elshishini and S. S. E. H. Elnashaie	553	Digital simulation of industrial fluid catalytic cracking units: bifurcation and its implications
E. Sobczak	561	A simple method of determination of mass transfer coefficients and surface reaction constants for crystal growth
		<i>Shorter Communication</i>
F. X. Malcata	565	The prediction of mass transfer rates during bubble growth in the presence of an instantaneous reaction on the liquid side

Number 3

W. A. Cole and S. P. Goodwin	569	Flash calculations for gas hydrates: a rigorous approach
J.-K. Chen, A. M. Martin and V. T. John	575	A kinetic analysis of competitive reaction in intrazeolitic media

S. Karve and V. A. Juvekar	587	Gas absorption into slurries containing fine catalyst particles
A. C. Kokossis and C. A. Floudas	595	Optimization of complex reactor networks—I. Isothermal operation
F. Magelli, D. Fajner, M. Nocentini and G. Pasquali	615	Solid distribution in vessels stirred with multiple impellers
C. I. Chiwetelu, V. Hornof and G. H. Neale	627	Mechanisms for the interfacial reaction between acidic oils and alkaline reagents
A. Jeje, B. Asante and B. Ross	639	Steam bubbling regimes and direct contact condensation heat transfer in highly subcooled water
J. Philip, J. M. Proctor, K. Niranjana and J. F. Davidson	651	Gas hold-up and liquid circulation in internal loop reactors containing highly viscous Newtonian and non-Newtonian liquids
A. M. Reimus, G. Carta and J. L. Hudson	665	Effects of interfacial diffusive transport on the dynamics of oscillating reactions
A. Leitão and A. Rodrigues	679	Fixed-bed reactor for gasoline sweetening: kinetics of mercaptan oxidation and simulation of the Merox reactor unit
M. R. Davidson	687	Flow in the stagnation zone during submerged injection of a swirling gas jet
S. Pavlou and C. G. Vayenas	695	Optimal catalyst activity profile in pellets with shell-progressive poisoning: the case of fast linear kinetics
A. Burghardt and M. Berezowski	705	Analysis of the structure of steady-state solutions for porous catalytic pellets—first-order reversible reactions
L. E. Stermann and B. E. Ydstie	721	The steady-state process with periodic perturbations
L. E. Stermann and B. E. Ydstie	737	Unsteady-state multivariable analysis of periodically perturbed systems
P. Traub and K. Stephan	751	High-pressure phase equilibria of the system CO ₂ –water–acetone measured with a new apparatus
		<i>Shorter Communications</i>
K. B. Kushalkar and V. G. Pangarkar	759	Liquid holdup and dispersion in packed columns
M. Punčochář, J. Drahoš and J. Čermák	764	The dependence of fluidization regime upon the bed structure at the onset of fluidization
K. K. Lee, E. L. Cussler, M. Marchetti and M. A. McHugh	766	Pressure-dependent phase transitions in hydrogels
		<i>Letter to the Editors</i>
G. H. Graaf, P. J. J. M. Sijtsma, E. J. Stamhuis and G. E. H. Joosten	769	On chemical equilibria in methanol synthesis
		<i>Book Review</i>
P. S. Hatton	771	Viscous and Compressible Fluid Dynamics. By M. E. O'Neill and F. Chorlton

Number 4

G. H. Graaf, H. Scholtens, E. J. Stamhuis and A. A. C. M. Beenackers	773	Intra-particle diffusion limitations in low-pressure methanol synthesis
C. Tsouris and L. L. Tavlarides	785	Dispersed-phase residence times and axial drop velocities in a multistage column contactor
E. Neau, P. Alessi, M. Fermeglia and I. Kikic	795	Low-pressure equilibrium data for the prediction of solubility in carbon dioxide
P. Ayazi Shamlou, Z. Liu and J. G. Yates	809	Hydrodynamic influences on particle breakage in fluidized beds
E. Tsotsas and E.-U. Schlünder	819	Heat transfer in packed beds with fluid flow: remarks on the meaning and the calculation of a heat transfer coefficient at the wall
O. Lev, M. Sheintuch, H. Yarnitsky and L. M. Pismen	839	Spatial current distribution during nickel anodic dissolution in sulfuric acid
H. Nasr-El-Din, J. H. Masliyah and K. Nandakumar	849	Continuous gravity separation of concentrated bidisperse suspensions in a vertical column
P. E. Savage	859	Pyrolysis of a binary mixture of complex hydrocarbons: reaction modeling
E. A. Macedo, P. Skovborg and P. Rasmussen	875	Calculation of phase equilibria for solutions of strong electrolytes in solvent-water mixtures
J. C. Pinto, M. W. Lobão and J. L. Monteiro	883	Sequential experimental design for parameter estimation: a different approach
Y. Du and T.-M. Guo	893	Prediction of hydrate formation for systems containing methanol
S. Wachi and Y. Nojima	901	Gas-phase dispersion in bubble columns
J. Baldyga and J. R. Bourne	907	The effect of micromixing on parallel reactions
A. Brunovská, M. Morbidelli and P. Brunovský	917	Optimal catalyst pellet activity distributions for deactivating systems
L. K. Filippov, I. V. Filippova and L. Czepirski	927	Technological computation of frontal modes in adsorption separation of multicomponent mixtures
Y.-M. Chen and L.-S. Fan	935	Drift flux in gas-liquid-solid fluidized systems from the dynamics of bed collapse
N. I. Jaeger, R. Ottensmeyer, P. J. Plath and H. Engel-Herbert	947	Dynamics of the heterogeneous catalytic oxidation of ethanol—I. Analysis of experimental bifurcation diagrams
H. Engel-Herbert, P. J. Plath, R. Ottensmeyer, Th. Schnelle and J. Kaldasch	955	Dynamics of the heterogeneous catalytic oxidation of ethanol—II. Qualitative modelling of dynamic features
D. C. Arters and L.-S. Fan	965	Experimental methods and correlation of solid-liquid mass transfer in fluidized beds
G. Li and H. Rabitz	977	A general analysis of approximate lumping in chemical kinetics
J. Zhu, J. R. Grace and C. J. Lim	1003	Tube wear in gas fluidized beds—I. Experimental findings

J. T. Hsu and U. P. Ernst	1017	Theoretical studies of reaction chromatograms by the Fast Fourier Transform technique
J. Gram, M. de Bang and J. Villadsen	1031	An automated glucose isomerase reactor system with online flow injection analyzers for monitoring of pH, glucose and fructose concentrations
S. A. K. Jeelani, N. Fidi and S. Hartland	1043	Foam formation during CO ₂ desorption from agitated supersaturated aqueous surfactant solutions
T. Akiyama, Y. Nakano, Y. Tanijiri, H. Kazama and H. Fujiyasu	1049	Characteristics of evaporated stearic acid films prepared by the hot wall technique
R.-H. Jean and L.-S. Fan	1057	Rise velocity and gas-liquid mass transfer of a single large bubble in liquids and liquid-solid fluidized beds
A. E. Almstedt and V. Zakkay	1071	An investigation of fluidized-bed scaling—capacitance probe measurements in a pressurized fluidized-bed combustor and a cold model bed
H. A. Dijkstra and A. A. H. Drinkenburg	1079	Enlargement of wetted area and mass transfer due to surface tension gradients: the creeping film phenomenon
D. T. Lynch and N. P. Walters	1089	Frequency response characterization of reaction systems: external recycle reactor with a solid adsorbent
X. Lu, R. Madey, D. Rothstein, M. Jaroniec and J.-C. Huang	1097	Pressure swing adsorption for a system with a Langmuir-Freundlich isotherm
J. G. Yates, R. S. Ruiz-Martinez and D. J. Cheesman	1105	Prediction of bubble size in a fluidized bed containing horizontal tubes
J. T. Tinge, H. A. Dijkstra, J. Boelen, C. J. C. Stoelwinder and A. A. H. Drinkenburg	1113	Gas separation in a three-phase bubble column
<i>Shorter Communications</i>		
S. C. Saxena and S. Shrivastava	1125	The influence of an external magnetic field on an air-fluidized bed of ferromagnetic particles
S. S. Bhagwat	1130	Gas-liquid-solid reactions: importance of fine bubbles near solid-liquid interface
R. Lortie and G. André	1133	On the use of apparent kinetic parameters for enzyme-bearing particles with internal mass-transfer limitations
A. A. Shaikh and S. M. Zarook	1137	Some remarks on the effect of flow direction on steady-state multiplicity in bubble column reactors
S. V. Jadhav and V. G. Pangarkar	1139	Solid-liquid mass transfer in packed bubble columns
J. C. Smeltzer and P. S. Fedkiw	1144	Surface-concentration behavior in the presence of an oscillating reactant flux to the wall
<i>Letter to the Editors</i>		
Y. Shirai, M. Louhi, S. Palosaari, K. Nakanishi and R. Matsuno	1147	Comments on the prediction of ice crystal size distribution in a continuous crystallizer
<i>Book Reviews</i>		
R. J. Wakeman	1149	Crossflow Filtration. By J. Murkes and C. G. Carlsson
G. S. Virk	1149	Robust Process Control. By M. Morari and E. Zafiriou

H. Hofmann

- 1150 DECHEMA Chemistry Data Series. Edited by D. Behrens and R. Eckermann. Vol. 1, Part 1b, Vapour-Liquid Equilibrium Data Collection, Aqueous Systems (Supplement 2). By J. Gmeling, U. Onken and J. R. Rarey-Nies. Vol. 1, Part 2e, Vapour-Liquid Equilibrium Data Collection, Organic Hydroxy Compounds: Alcohols (Supplement 3). By J. Gmeling, U. Onken and J. R. Rarey-Nies. Vol. 5, Part 4, Liquid-Liquid Equilibrium Data Collection (Supplement 1). By E. A. Macedo and P. Rasmussen.

Number 5

**A. N. Bhaskarwar, D. Desai
and R. Kumar**

- 1151 General model of a foam bed reactor

**U. Sedran, A. Mahay
and H. I. de Lasa**

- 1161 Modelling methanol conversion to hydrocarbons: revision and testing of a simple kinetic model

**H. Bosch, G. F. Versteeg
and W. P. M. van Swaaij**

- 1167 Kinetics of the reaction of CO₂ with the sterically hindered amine 2-amino-2-methylpropanol at 298 K

J. S. Dennis and A. N. Hayhurst

- 1175 Mechanism of the sulphation of calcined limestone particles in combustion gases

R. A. Bortolozzi and J. A. Deiber

- 1189 Mass transfer between growing air bubbles and an emulsion of coal particles in fluidized gasification and combustion

Y. Taitel and D. Barnea

- 1199 A consistent approach for calculating pressure drop in inclined slug flow

**C. Bernot, M. F. Doherty
and M. F. Malone**

- 1207 Patterns of composition change in multicomponent batch distillation

M. Bentrçia and D. A. Drew

- 1223 Fouling layer growth and distribution at the interface of pressure-driven membranes

**M. R. Mackley, G. M. Tweddle
and I. D. Wyatt**

- 1237 Experimental heat transfer measurements for pulsatile flow in baffled tubes

I. Molnár, S. Halász and T. Blickle

- 1243 Determination of size-dependent crystal growth characteristics from batch experiments

**N. S. Srinivasan
and L.-I. Staffansson**

- 1253 A theoretical analysis of the fluidized-bed process for the reduction of iron ores

M. Atiqullah and E. B. Nauman

- 1267 A model and measurement technique for micromixing in copolymerization reactors

**D. Herskowitz, V. Herskowitz,
K. Stephan and A. Tamir**

- 1281 Characterization of a two-phase impinging jet absorber—II. Absorption with chemical reaction of CO₂ in NaOH solutions

H.-S. Liu and H.-W. Hsu

- 1289 Analysis of gas stripping during ethanol fermentation—I. In a continuous stirred tank reactor

**E. Bauman, A. Varma, J. Lorusso,
M. Dente and M. Morbidelli**

- 1301 Parametric sensitivity in tubular reactors with co-current external cooling

J.-W. Chang and C.-C. Yu

- 1309 The relative gain for non-square multivariable systems

M. Berezowski

- 1325 A sufficient condition for the existence of single steady states in chemical reactors with recycle

J. Adaje and M. Sheintuch	1331	Comparison of multiplicity patterns of a single catalytic pellet and a fixed catalytic bed for ethylene oxidation
R. W. Field	1343	A theoretical viscosity correction factor for heat transfer and friction in pipe flow
T. Howes and M. R. Mackley	1349	Experimental axial dispersion for oscillatory flow through a baffled tube
H. W. Chandler and J. H. Song	1359	A variational principle for the compaction of granular materials
J. S. Yoo and H. H. Lee	1367	A sufficient condition for stability of catalyst pellet system with unit Lewis number
D. D. Do	1373	Hierarchy of rate models for adsorption and desorption in bidispersed structured sorbents
J. C. R. Turner	1383	Taylor dispersion of expanding gases in pipe flow
A. I. Jomha, M. F. Edwards and L. V. Woodcock	1389	New method for predicting the power requirement for mixing shear thickening suspensions
W. A. Cole and W. A. Wakeham	1397	Prediction of the thermodynamic properties of sulphur hexafluoride
P. Ayazi Shamlou, A. G. Jones and K. Djamarani	1405	Hydrodynamics of secondary nucleation in suspension crystallization
		<i>Shorter Communications</i>
R. Zarzycki, A. Chacuk, M. Starzak and E. Nagy	1417	Remarks on using the film model in physical and chemical mass transfer in the liquid phase
D. D. Do and R. G. Rice	1419	Applicability of the external-diffusion model in adsorption studies
B. K. Cho	1422	Determination of coverage-dependent heat of adsorption from transient pulse experiments
E. Van den Bulck	1425	Isotherm correlation for water vapor on regular-density silica gel
K. Tsuchiya, G.-H. Song and L.-S. Fan	1429	Effects of particle properties on bubble rise and wake in a two-dimensional liquid-solid fluidized bed
		<i>Book Review</i>
A. Arrowsmith	1435	Atomization and Sprays. By A. H. Lefebvre
	1437	Corrigendum
		<i>Obituary</i>
	1439	Professor J. M. Coulson
		<i>Announcement</i>
	1441	<i>Chemical Engineering Science</i> Special Issue: Symposium in Print on Bioseparations

Number 6

M. Sahimi, G. R. Cavalas and T. T. Tsotsis	1443	Review Article Number 32. Statistical and continuum models of fluid-solid reactions in porous media
D. Dimitrelis and J. M. Prausnitz	1503	Molecular thermodynamics of fluid mixtures at low and high densities

R. A. Novy, H. T. Davis and L. E. Scriven	1515	Upstream and downstream boundary conditions for continuous-flow systems
A. Mehra	1525	Gas absorption in slurries of finite-capacity microphases
M. Jaroniec, X. Lu, R. Madey and J. Choma	1539	Comparative studies of adsorption of ethane and benzene on microporous activated carbons
A. A. P. de Alwis and P. J. Fryer	1547	A finite-element analysis of heat generation and transfer during ohmic heating of food
L. G. Gibilaro, R. Di Felice and P. U. Foscolo	1561	Added mass effects in fluidized beds: application of the Geurst-Wallis analysis of inertial coupling in two-phase flow
D. A. White	1567	Gas diffusion cascades—properties and optimization
M. F. Larrousse and W. R. Wilcox	1571	Interfacial mass transfer to a cylinder endwall during spin-up/spin-down
C. F. Mignone	1583	The agitation-step method for $K_L a$ measurement
B. W. Brooks	1589	Product yields from the Van de Vusse reaction scheme: use of semi-batch reactors
J. I. Ramos and R. Pitchumani	1595	Liquid curtains—II. Gas absorption
A. Rehfinger and U. Hoffmann	1605	Kinetics of methyl tertiary butyl ether liquid phase synthesis catalyzed by ion exchange resin—I. Intrinsic rate expression in liquid phase activities
A. Rehfinger and U. Hoffmann	1619	Kinetics of methyl tertiary butyl ether liquid phase synthesis catalyzed by ion exchange resin—II. Macropore diffusion of methanol as rate-controlling step
K. Rietema and H. W. Piepers	1627	The effect of interparticle forces on the stability of gas-fluidized beds—I. Experimental evidence
		<i>Shorter Communications</i>
S. P. Crockett and W. H. Smyrl	1641	A single expansion treatment of fluid motion at a rotating disk
R. Baratti, G. Cao, M. Morbidelli and A. Varma	1643	Optimal activity distribution in nonuniformly impregnated catalyst particles: numerical analysis
P. U. Foscolo, R. Di Felice, L. G. Gibilaro, L. Pistone and V. Piccolo	1647	Scaling relationships for fluidisation: the generalised particle bed model
		<i>Letters to the Editors</i>
J. R. Nebrensky	1653	Comments on predicting the free-fall velocities of spheres
M. Hartman	1653	Author's reply to comments by J. R. Nebrensky
A. Pethö	1654	Further to the Aris <i>Festschrift</i>
		<i>Book Reviews</i>
P. N. Rowe	1655	Gas-Liquid-Solid Fluidization Engineering. By L.-S. Fan
A. W. Deakin	1655	Aerosol Sampling Science and Practice. By J. H. Vincent
W. A. Wakeham	1656	Heats of Vaporization of Fluids. By V. Majer, V. Svoboda and J. Pick
R. E. Franklin	1656	Fluid Dynamics and Flow-induced Vibrations of Tube Banks. By A. Zukauskas, R. Ulinskas and V. Katinas

- N. Thomas 1656 Physicochemical Hydrodynamics. By R. F. Probstein
 J. M. Winterbottom 1657 Catalyst Handbook. Edited by M. V. Twigg

Number 7

- G. A. Cordonier, L. D. Schmidt and R. Aris 1659 Forced oscillations of chemical reactors with multiple steady states
 M. J. Ellman, N. Midoux, G. Wild, A. Laurent and J. C. Charpentier 1677 A new, improved liquid hold-up correlation for trickle-bed reactors
 R. Krupiczka, A. Rotkegel, K. Oswatitsch and W. Hantsch 1685 Selectivity during condensation of binary mixtures in a nozzle with countercurrent flow of vapour and condensate
 J. C. P. Wang, F. R. Groves and D. P. Harrison 1693 Modeling high temperature desulfurization in a fixed-bed reactor
 J. J. Frijlink, A. Bakker and J. M. Smith 1703 Suspension of solid particles with gassed impellers
 G. C. Stangle and I. A. Aksay 1719 Simultaneous momentum, heat and mass transfer with chemical reaction in a disordered porous medium: application to binder removal from a ceramic green body
 P. A. Olowson and A. E. Almstedt 1733 Influence of pressure and fluidization velocity on the bubble behaviour and gas flow distribution in a fluidized bed
 M. Lebrun and B. Spinner 1743 Models of heat and mass transfers in solid-gas reactors used as chemical heat pumps
 T. G. Lenz and J. D. Vaughan 1755 Computer-based molecular mechanics techniques for accurate prediction of thermodynamic properties of chemically reactive systems
 M. P. Schwarz 1765 Sloshing waves formed in gas-agitated baths
 R. Krishna 1779 Multicomponent surface diffusion of adsorbed species: a description based on the generalized Maxwell-Stefan equations
 S. A. Godorr, B. D. Young and A. W. Bryson 1793 Characterising and modelling of the growth of a rough surface
 V. Julka and M. F. Doherty 1801 Geometric behavior and minimum flows for nonideal multicomponent distillation
 H. N. Pham and M. F. Doherty 1823 Design and synthesis of heterogeneous azeotropic distillations—I. Heterogeneous phase diagrams
 H. N. Pham and M. F. Doherty 1837 Design and synthesis of heterogeneous azeotropic distillations—II. Residue curve maps
 H. N. Pham and M. F. Doherty 1845 Design and synthesis of heterogeneous azeotropic distillations—III. Column sequences
 H. Wu, A. Brunovská, M. Morbidelli and A. Varma 1855 Optimal catalyst activity profiles in pellets—VIII. General nonisothermal reacting systems with arbitrary kinetics
 J. Moiola, A. Desages and J. Romagnoli 1863 Bifurcations in chemical reactors via feedback system theory

H. A. J. Kennis, Th. W. de Loos, J. de Swaan Arons, R. Van der Haegen and L. A. Kleintjens	1875	The influence of nitrogen on the liquid-liquid phase behaviour of the system n-hexane-polyethylene: experimental results and predictions with the mean-field lattice-gas model
M. P. Srinivasan, J. M. Smith and B. J. McCoy	1885	Supercritical fluid desorption from activated carbon
M. Sheintuch and J. Adjaye	1897	Excitable waves in a fixed bed reactor: ethylene oxidation on platinum
G. Brem and J. J. H. Brouwers	1905	Analytical solutions for non-linear conversion of a porous solid particle in a gas—I. Isothermal conversion
G. Brem and J. J. H. Brouwers	1915	Analytical solutions for non-linear conversion of a porous solid particle in a gas—II. Non-isothermal conversion and numerical verification
<i>Shorter Communications</i>		
M. A. Soliman and S. S. E. H. Elnashaie	1925	Negative effectiveness factors for cyclic reversible reactions
J. Jezowski	1928	A simple synthesis method for heat exchanger networks with minimum number of matches
R. B. Keey	1933	The influence of feeding irregularities on the through-circulation drying of loose materials
R. A. Rajadhyaksha, K. K. Pitale and S. S. Tambe	1935	Correlation effects in counterdiffusion in zeolites
<i>Letters to the Editors</i>		
B. S. Balzhinimaev, N. P. Belyaeva and S. I. Reshetnikov	1939	Comments on modelling of SO ₂ oxidation rates based on kinetic data of a Cs/V catalyst at high pressures and conversions
F. J. Doering	1941	Author's reply to comments by Balzhinimaev <i>et al.</i>
<i>Book Review</i>		
R. R. Hudgins	1943	Catalytic Processes under Unsteady-state Conditions. By Yu. Sh. Matros

Number 8

Special issue: ISCRE 11

ix Preface

xi List of reviewers

Plenary papers

J. Wei	1947	P1. New horizons in reaction engineering
J. R. Grace	1953	P2. High-velocity fluidized bed reactors
R. Langer, H. Bernstein, L. Brown and L. Cima	1967	P3. Medical reactors
D. Luss	1979	P4. Reaction engineering of advanced ceramic materials
R. A. van Santen	2001	P5. Computational advances in catalyst modelling
A. T. Bell	2013	P6. The impact of catalyst science on catalyst design and development
L. L. Hegedus and C. J. Pereira	2027	P7. Reaction engineering for catalyst design
J. H. Seinfeld	2045	P8. The environment and chemical reaction engineering

Session A: modeling and scaleup	
C. LaMarca, C. Libanati and M. T. Klein	2059 A1. Design of kinetically coupled complex reaction systems
A. Rastogi, A. Vega, C. Georgakis and H. G. Stenger, Jr.	2067 A2. Optimization of catalyzed epoxidation of unsaturated fatty acids by using tendency models
J. L. Hudson, M. Kube, R. A. Adomaitis, I. G. Kevrekidis, A. S. Lapedes and R. M. Farber	2075 A3. Nonlinear signal processing and system identification: applications to time series from electrochemical reactions
M. Neurock, C. Libanati, A. Nigam and M. T. Klein	2083 A4. Monte Carlo simulation of complex reaction systems: molecular structure and reactivity in modelling heavy oils
A. O. E. Beyne and G. F. Froment	2089 A5. A percolation approach for the modeling of deactivation of zeolite catalysts by coke formation
Yu. Sh. Matros	2097 A6. Performance of catalytic processes under unsteady conditions
E. C. Martinez and L. J. Beltramini	2103 A7. Lumping upon time-scales: modeling upon topological factors
N. A. Bhole, M. T. Klein and K. B. Bischoff	2109 A8. Species rank in reaction pathways: application of Delplot analysis
H. van der Eijk, G. J. den Otter, P. M. M. Blauwhoff and I. E. Maxwell	2117 A9. The application of advanced process models in oil refining R & D
M. Sheintuch	2125 A10. Excitable waves in a fixed bed reactor: observations and analysis
E. G. Bauman and A. Varma	2133 A11. Parametric sensitivity and runaway in catalytic reactors: experiments and theory using carbon monoxide oxidation as an example
R. Küfner and H. Hofmann	2141 A12. Implementation of radial porosity and velocity distribution in a reactor model for heterogeneous catalytic gasphase reactions (TORUS-model)
R. R. Natu and U. V. Shenoy	2147 A13. A new micromixing model for turbulent reactors
D. L. Weidman and W. E. Stewart	2155 A14. Catalyst particle modelling in fixed-bed reactors
D. Hildebrandt and D. Glasser	2161 A15. The attainable region and optimal reactor structures
D. Suter, A. Bartoli, F. Schneider, D. W. T. Rippin and E. J. Newson	2169 A16. Radial flow reactor optimization for highly exothermic selective oxidation reactions
Session B: multiphase reactors	
P. A. Ambler, B. J. Milne, F. Berruti and D. S. Scott	2179 B1. Residence time distribution of solids in a circulating fluidized bed: experimental and modelling studies
G. Sun and J. R. Grace	2187 B2. The effect of particle size distribution on the performance of a catalytic fluidized bed reactor
M. C. Phillips	2195 B3. A parametric sensitivity study on the relative importance of packet formation and single-particle motion in fluidized bed heat transfer

A. V. Sapre, T. M. Leib and D. H. Anderson	2203	B4. FCC regenerator flow model
C. E. J. van Lare, H. W. Piepers and D. Thoenes	2211	B5. Scaling and particle size optimization of mass transfer in gas fluidized beds
A. Gianetto, S. Pagliolico, G. Rovero and B. Ruggeri	2219	B6. Theoretical and practical aspects of circulating fluidized bed reactors (CFBRs) for complex chemical systems
T. Baron, C. L. Briens, P. Galtier and M. A. Bergougnou	2227	B7. Verification of models and correlations for bubble properties in fluidized beds
A. Zaidi, W.-D. Deckwer, A. Mrani and B. Benchechou	2235	B8. Hydrodynamics and heat transfer in three-phase fluidized beds with highly viscous pseudoplastic solutions
D. C. Dankworth, I. G. Kevrekidis and S. Sundaresan	2239	B9. Time dependent hydrodynamics in multiphase reactors
W. J. A. Wammes and K. R. Westerterp	2247	B10. The influence of the reactor pressure on the hydrodynamics in a cocurrent gas-liquid trickle-bed reactor
P. M. Haure, S. M. Bogdashev, M. Bunimovich, A. N. Stegasov, R. R. Hudgins and P. L. Silveston	2255	B11. Thermal waves in the periodic operation of a trickle-bed reactor
A. V. Sapre, D. H. Anderson and F. J. Krambeck	2263	B12. Heater probe technique to measure flow maldistribution in large scale trickle bed reactors
P. Trambouze	2269	B13. Countercurrent two-phase flow fixed bed catalytic reactors
L. van Dierendonck, T. Smeets, S. Sicardi, L. Manna and G. Baldi	2277	B14. A new model for the kinetics study of a multiphase batch reactor
N. Devanathan, D. Moslemian and M. P. Dudukovic	2285	B15. Flow mapping in bubble columns using CARPT
I. G. Reilly, D. S. Scott, T. J. W. de Bruijn, D. MacIntyre and J. Piskorz	2293	B16. Axial solids concentrations in three-phase bubble columns
K. N. Clark	2301	B17. The effect of high pressure and temperature on phase distributions in a bubble column
P. M. Wilkinson and L. L. v. Dierendonck	2309	B18. Pressure and gas density effects on bubble break-up and gas hold-up in bubble columns
J. R. Turner and P. L. Mills	2317	B19. Comparison of axial dispersion and mixing cell models for design and simulation of Fischer-Tropsch slurry bubble column reactors
R. Torvik and H. F. Svendsen	2325	B20. Modelling of slurry reactors. A fundamental approach
C. A. M. C. Dirix and K. van der Wiele	2333	B21. Mass transfer in jet loop reactors
K. Scott and B. Hayati	2341	B22. The multiphase electrochemical synthesis of adiponitrile
S. G. Hatzikiriakos, R. P. Gaikwad and J. M. Shaw	2349	B23. Transitional drop size distributions in gas agitated liquid-liquid dispersions

		Session C: biochemical and biomedical reaction engineering
K. Zygorakis	2359	C1. Development and temporal evolution of erosion fronts in bioerodible controlled release devices
C. Starbuck, H. S. Wiley and D. A. Lauffenburger	2367	C2. Epidermal growth factor binding and trafficking dynamics in fibroblasts: relationship to cell proliferation
R. J. De Boer, I. G. Kevrekidis and A. S. Perelson	2375	C3. A simple idiotypic network model with complex dynamics
C. Ongcharit, Y. T. Shah and K. L. Sublette	2383	C4. Novel immobilized cell reactor for microbial oxidation of H_2S
J. M. Woodley and M. D. Lilly	2391	C5. Extractive biocatalysis: the use of two-liquid phase biocatalytic reactors to assist product recovery
L. A. M. van der Wielen, J. J. M. Potters, A. J. J. Straathof and K. Ch. A. M. Luyben	2397	C6. Integration of bioconversion and continuous product separation by means of countercurrent adsorption
		Session D: novel reactors
R. F. Blanks, T. S. Wittrig and D. A. Peterson	2407	D1. Bidirectional adiabatic synthesis gas generator
H. J. Sloot, G. F. Versteeg and W. P. M. van Swaaij	2415	D2. A non-permselective membrane reactor for chemical processes normally requiring strict stoichiometric feed rates of reactants
A. M. Champagnie, T. T. Tsotsis, R. G. Minet and I. A. Webster	2423	D3. A high temperature catalytic membrane reactor for ethane dehydrogenation
A. Ray, A. L. Tonkovich, R. Aris and R. W. Carr	2431	D4. The simulated countercurrent moving bed chromatographic reactor
M. I. Cabrera, O. M. Alfano and A. E. Cassano	2439	D5. Product yield and selectivity studies in photoreactor design. Theory and experiments for the chlorination of methane
D. W. Kraemer, U. Sedran and H. I. de Lasa	2447	D6. Catalytic cracking kinetics in a novel riser simulator
W. H. Gauvin	2453	D7. Novel reactors for plasma applications
H. Zhu, Y. C. Lau and E. Pfender	2461	D8. Deposition of $YBa_2Cu_3O_{7-x}$ thick films using an RF thermal plasma reactor
I. Zouari, F. Lapicque, M. Calvo and M. Cabrera	2467	D9. Laser assisted metal electrodeposition: comprehensive investigation of zinc deposition
M. Douyon de Azevedo and J.-L. Meunier	2475	D10. Ionic flux distributions for the vacuum arc deposition of diamondlike films
C. B. Laflamme, J. W. Jurewicz, D. V. Gravelle and M. I. Boulos	2483	D11. Thermal plasma reactor for the processing of gaseous hydrocarbons
R. J. Munz and O. S. Mersereau	2489	D12. A plasma spout-fluid bed for the recovery of vanadium from vanadium ore
		Session E: material processing
H. W. Dandekar, C. C. Agrafiotis, J. A. Puszynski and V. Hlavacek	2499	E1. Modeling and analysis of filtration combustion for synthesis of transition metal nitrides
P. McAllister and E. E. Wolf	2505	E2. Modeling of chemical vapor infiltration of carbon composites with pyrolytic carbon

P. E. Price Jr. and K. F. Jensen	2511	E3. Optically induced bifurcations in laser direct-write metallization
M. P. Duduković, J. L. Kardos, I. S. Yoon and Y. B. Yang	2519	E4. Autoclave processing of long fiber thermoplastic composites
T. Kojima, T. Kimura and M. Matsukata	2527	E5. Development of numerical model for reactions in fluidized bed grid zone—application to chemical vapor deposition of polycrystalline silicon by monosilane pyrolysis
K. A. Pilcher and J. Bridgwater	2535	E6. Pinning in a rectangular moving bed reactor with gas cross-flow
J. H. Scholtz, J. E. Gatica, H. J. Viljoen, V. Revankar and V. Hlavacek	2543	E7. CVD reactors for the synthesis of inorganic fibers. Modeling and experimental evaluation
M. R. Zachariah	2551	E8. Modeling ceramic sub-micron particle formation from the vapor using detailed chemical kinetics: comparison with in situ laser diagnostics
Session F: catalyst design		
I. E. Wachs	2561	F1. Molecular engineering of supported metal oxide catalysts
D. S. Lafyatis and H. C. Foley	2567	F2. Molecular modelling of the shape selectivity for the Fischer-Tropsch reaction using a tri-functional catalyst
M. Hoffmeister and D. Hesse	2575	F3. The influence of the pore structure of the support on the properties of supported liquid-phase catalysts
W. Suarez, W.-C. Cheng, K. Rajagopalan and A. W. Peters	2581	F4. Estimation of hydrogen transfer rates over zeolite catalysts
G. Centi and F. Trifiro	2589	F5. Surface kinetics of adsorbed intermediates: selective oxidation of C ₄ –C ₅ alkanes
J. C. Kellow and E. E. Wolf	2597	F6. Infrared thermography and FTIR studies of catalyst preparation effects on surface reaction dynamics during CO and ethylene oxidation on Rh/SiO ₂ catalysts
J. W. Beeckman	2603	F7. Mathematical description of heterogeneous materials
C. L. Cui, J. R. Authelin, D. Schweich and J. Villermaux	2611	F8. Consequence of distributed properties on effective diffusivities in porous solids
D. B. Dadyburjor and C. W. White III	2619	F9. Effect of position-dependent deactivation on the design of a composite cracking catalyst
P.-S. E. Dai, D. E. Sherwood and B. R. Martin	2625	F10. Effect of diffusion on resid hydrodesulfurization activity
T. C. Ho and S. C. Reyes	2633	F11. Design of catalyst sulfiding procedures
K. J. Smith, R. G. Herman and K. Klier	2639	F12. Kinetic modelling of higher alcohol synthesis over alkali-promoted Cu/ZnO and MoS ₂ catalysts
R. F. Hicks, H. Qi, M. L. Young, R. G. Lee, W. J. Han and A. B. Kooh	2647	F13. Effect of catalyst structure on the rate of alkane oxidation over platinum
A. E. Rodrigues and R. M. Quinta Ferreira	2653	F14. Effect of intraparticle convection on the steady-state behavior of fixed-bed catalytic reactors

S. Kito, T. Hattori and Y. Murakami	2661	F15. An expert systems approach to computer-aided design of multi-component catalysts
K. Schnitzlein and A. Löwe	2671	Session G: environmental G1. Numerical simulation of the performance of ceramic fiber coil diesel particulate traps
G. Centi, A. Riva, N. Passarini, G. Brambilla, B. K. Hodnett, B. Delmon and M. Ruwet	2679	G2. Simultaneous removal of SO ₂ /NO _x from flue gases. Sorbent/catalyst design and performances
B. Ruggeri, P. Tundo and W. Tumiatti	2687	G3. Supported liquid phase reactor (SLPR) for PCBs in oil decontamination
B. F. Hagh and D. T. Allen	2695	G4. Catalytic hydroprocessing of chlorinated benzenes
M. Lovo, H. A. Deans and V. Balakotaiah	2703	G5. Modeling and simulation of aqueous hazardous waste oxidation in deep well reactors
G. W. Roberts, D. M. Brown, T. H. Hsiung and J. J. Lewnard	2713	Session H: alternate energy H1. Catalyst poisoning during the synthesis of methanol in a slurry reactor
M. Weeda, P. J. J. Tromp and J. A. Moulijn	2721	H2. The potential of coal gasification in a novel iron oxide reduction process
F. Goudriaan and D. G. R. Peferoen	2729	H3. Liquid fuels from biomass via a hydrothermal process
J. J. Lewnard, T. H. Hsiung, J. F. White and D. M. Brown	2735	H4. Single-step synthesis of dimethyl ether in a slurry reactor
K. Yokota, Y. Hanakata and K. Fujimoto	2743	H5. Supercritical phase Fischer-Tropsch synthesis
R. E. Hogan, Jr., R. D. Skocypec, R. B. Diver, J. D. Fish, M. Garrait and J. T. Richardson	2751	H6. A direct absorber reactor/receiver for solar thermal applications
S. E. Zarkanitis, E. A. Efthimiadis and S. V. Sotirchos	2761	Session I: homogeneous kinetics/polymers I1. Experimental evaluation of a class of distributed pore size models for gas-solid reactions with solid product
A. Chakma and M. R. Islam	2769	I2. Modelling of visbreaking of bitumen in a jet reactor
J. F. Patzer II, S. K. Wolfson Jr and S. J. Yao	2777	I3. Reactor control and reaction kinetics for electrochemical urea oxidation
M. A. Dubé, A. Penlidis and K. F. O'Driscoll	2785	I4. Mathematical modelling of styrene/butyl acrylate copolymerization
T. Meyer and A. Renken	2793	I5. Characterization of segregation in a tubular polymerization reactor by a new chemical method
S. J. Tremont, E. E. Remsen and P. L. Mills	2801	I6. An experimental and modelling study of polybutadiene functionalization to polyaldehydes using a homogeneous rhodium catalyst
	2809	Author Index

Number 9

M. M. El-Halwagi and V. Manousiouthakis	2813	Automatic synthesis of mass-exchange networks with single-component targets
--	------	---

O. J. Smith IV and A. W. Westerberg	2833	Mixed-integer programming for pressure swing adsorption cycle scheduling
J. Gyenis and F. Kátai	2843	Determination and randomness in mixing of particulate solids
R. O. Fox and J. Villermaux	2857	Micromixing effects in the $\text{ClO}_2^- + \text{I}^-$ reaction: perturbation analysis and numerical simulation of the unsteady-state IEM model
Y. D. Chen, J. A. Ritter and R. T. Yang	2877	Nonideal adsorption from multicomponent gas mixtures at elevated pressures on a 5A molecular sieve
A.-F. A. Asfour and A. H. Nhaesi	2895	An improved model for mass transfer in three-phase fluidized beds
K. T. Yu, J. Huang, J. L. Li and H. H. Song	2901	Two-dimensional flow and eddy diffusion on a sieve tray
Y.-L. Hwang and F. G. Helfferich	2907	Dynamics of continuous countercurrent mass-transfer processes—IV. Multicomponent waves and asymmetric dynamics
P. E. Grimshaw, A. J. Grodzinsky, M. L. Yarmush and D. M. Yarmush	2917	Selective augmentation of macromolecular transport in gels by electrodiffusion and electrokinetics
J. D. Landgrebe, S. E. Pratsinis and S. V. R. Mastrangelo	2931	Nomographs for vapor synthesis of ceramic powders
Wang Shaoting, Zhang Fengbao, Ma Tengxiang and Gu Hanqing	2943	Investigation on patient-artificial kidney system using compartment models
M. Dekker, K. Van't Riet, B. H. Bijsterbosch, P. Fijneman and R. Hilhorst	2949	Mass transfer rate of protein extraction with reversed micelles
		<i>Shorter Communications</i>
S. S. Elshishini and S. S. E. H. Elnashaie	2959	Digital simulation of industrial fluid catalytic cracking units—II. Effect of charge stock composition on bifurcation and gasoline yield
S. S. E. H. Elnashaie and M. E. Abashar	2964	The implication of non-monotonic kinetics on the design of catalytic reactors
D. Lj. Petrović, D. Pošarac, A. Duduković and D. Skala	2967	Mixing time in gas-liquid-solid draft tube airlift reactors
A. Seidel	2970	Calculating chemical reaction equilibrium for a homogeneous phase from the material balance of a batch reactor
J. C. Merchuk and R. Yunker	2973	The role of the gas-liquid separator of airlift reactors in the mixing process
G. Azar and A. Tamir	2976	Dissolution of solids in a continuous impinging-streams contactor with two tangential pairs of liquid feeds: experiments and modeling
C. Schaller and G. Kreysa	2979	Measurement of fluid-fluid mass transfer with experimental elimination of dispersion effects
W. Blümel and P. Käferstein	2982	An approach to determining the axial mass transfer in the gas phase in coarse-grained gas-solid fluidised beds

N. Watanabe, S. Ohbayashi and H. Kurimoto	2984	Application of the infinite-frequency π criterion to a periodically operated isothermal CSTR
J.-Y. Day	2987	The fountain height and particle circulation rate in a spouted bed
E. N. Rudisill and M. D. LeVan	2991	Analytical approach to mass transfer in laminar flow in reactive hollow fibers and membrane devices with non-linear kinetics
M. Punčochář, J. Drahoš and J. Čermák	2994	The limits of applicability of pressure drop correlations
K. S. Gandhi and R. Kumar	2998	An elongational flow model for drop breakage in stirred turbulent dispersions
C.-L. Chiang and C. H. Yu	3002	Optimal pore size of catalysts for hydrodemetallation reactions
W. Chen, R. R. Fisher and J. C. Berg	3003	Simulation of particle size distribution in an aggregation-breakup process
D. G. Retzlöff, P. C.-H. Chan and M. Starzak	3007	<i>Letters to the Editors</i> Comments on singular points in the problem of steady-state multiplicity for the stirred tank reactor with consecutive reactions
Z. Rojkowski	3007	Comments on growth and dissolution kinetics of potassium sulphate crystals in aqueous 2-propanol solutions
A. G. Jones and J. Mydlarz	3009	Authors' reply to comments of Z. Rojkowski
F. Kolenda, J. P. Reymond and G. Dessalces	3011	<i>Book Reviews</i> Catalyst Design—Progress and Perspectives. Edited by L. L. Hegedus
G. A. Davies	3011	Granular Filtration of Aerosols and Hydrosols. By C. Tien
H. Hofmann	3012	DECHEMA Chemistry Data Series. Edited by D. Behrens and R. Eckermann. Vapor-Liquid Equilibria for Mixtures of Low Boiling Substances. By H. Knapp, S. Zeck and R. Langhorst. Thermal Conductivity and Viscosity Data of Fluid Mixtures. By K. Stephan and T. Heckenberger
M. S. Spencer	3012	Laboratory Studies of Heterogeneous Catalytic Processes. By E. G. Christoffel (revised and edited by Z. Paal)
T. R. Bott	3013	Heat Exchanger Design. By A. P. Fraas
	3015	Corrigenda
Number 10		
P. J. McLellan, T. J. Harris and D. W. Bacon	3017	Review Article Number 33. Error trajectory descriptions of nonlinear controller designs
E. M. Beshar and A. Meisen	3035	Low-temperature fluidized-bed Claus reactor performance
A. Lübbert and B. Larson	3047	Detailed investigations of the multiphase flow in airlift tower loop reactors
C. Tsouris, L. L. Tavlarides and J. C. Bonnet	3055	Application of the ultrasonic technique for real-time holdup monitoring for the control of extraction columns

Guan Jianyu and Ye Zhenhua	3063	Analog circuit for simulation of pressure swing adsorption
B. J. Ennis, J. Li, G. I. Tardos and R. Pfeffer	3071	The influence of viscosity on the strength of an axially strained pendular liquid bridge
J. Sabaté, S. Cervera-March, R. Simarro and J. Giménez	3089	Photocatalytic production of hydrogen from sulfide and sulfite waste streams: a kinetic model for reactions occurring in illuminated suspensions of CdS
R. Font and J. M. Lopez	3097	Kinetics of insoluble-substrate fermentation in mixed continuous-flow systems
Y. W. Nam, R. R. Hudgins and P. L. Silveston	3111	Storage models for ammonia synthesis over iron catalyst under periodic operation
P. Basu	3123	Heat transfer in high temperature fast fluidized beds
R. Sant and E. E. Wolf	3137	Elementary-step modeling and transient FTIR studies of CO oxidation on Rh/SiO ₂
W. J. A. Wammes, S. J. Mechielsen and K. R. Westerterp	3149	The transition between trickle flow and pulse flow in a cocurrent gas-liquid trickle-bed reactor at elevated pressures
K. B. van Gelder, J. K. Damhof, P. J. Kroijenga and K. R. Westerterp	3159	Three-phase packed bed reactor with an evaporating solvent—I. Experimental: the hydrogenation of 2,4,6-trinitrotoluene in methanol
K. B. van Gelder, P. C. Borman, R. E. Weenink and K. R. Westerterp	3171	Three-phase packed bed reactor with an evaporating solvent—II. Modelling of the reactor
<i>Shorter Communication</i>		
P. N. Reddy, D. P. Rao and M. S. Rao	3193	The texture of liquid flow in trickle-bed reactors
<i>Letters to the Editors</i>		
C. Yao	3199	Comments on the relative importance of pore and surface diffusion in non-equilibrium adsorption rate processes
R. G. Rice and D. D. Do	3200	Authors' reply to comments by C. Yao
L. G. Gibilaro and P. U. Foscolo	3201	Comments on generalization of the Foscolo-Gibilaro analysis of dynamic waves
D. D. Joseph	3202	Author's reply to comments by L. G. Gibilaro and P. U. Foscolo

Number 11

iii Danckwerts-Maxwell Prize

R. H. Davis and J. D. Sherwood	3203	A similarity solution for steady-state crossflow micro-filtration
L. J. Kelsey, M. R. Pillarella and A. L. Zydney	3211	Theoretical analysis of convective flow profiles in a hollow-fiber membrane bioreactor
R. Yadav and R. G. Rinker	3221	An experimental study of methane synthesis by concentration forcing
M. Mattea, M. J. Urbicain and E. Rotstein	3227	Prediction of thermal conductivity of cellular tissues during dehydration by a computer model
R. Roy, J. F. Davidson and V. G. Tuponogov	3233	The velocity of sound in fluidised beds

J. I. Morell and N. R. Amundson	3247	The combustion behavior of retorted shale particles
A. Kapoor and R. T. Yang	3261	Surface diffusion on energetically heterogeneous surfaces—an effective medium approximation approach
N. R. Anturkar, T. C. Papanastasiou and J. O. Wilkes	3271	Lubrication theory for n -layer thin-film flow with applications to multilayer extrusion and coating
M. H. Oyevaar, R. W. J. Morssinkhof and K. R. Westerterp	3283	The kinetics of the reaction between CO_2 and diethanolamine in aqueous ethyleneglycol at 298 K: a viscous gas-liquid reaction system for the determination of interfacial areas in gas-liquid contactors
C.-C. Yu and M. K. H. Fan	3299	Decentralized integral controllability and D-stability
X.-L. Yang, J.-P. Euzen and G. Wild	3311	Residence time distribution of the liquid in gas-liquid cocurrent upflow fixed-bed reactors with porous particles
H. Orbey and J. H. Vera	3319	The simplest cubic equation of state for low-pressure vapor-liquid equilibrium calculations
G. W. Johnson and R. S. Kapner	3329	The dependence of axial dispersion on non-uniform flows in beds of uniform packing
J. Alvarez, R. Suárez and A. Sánchez	3341	Nonlinear decoupling control of free-radical polymerization continuous stirred tank reactors
H. V. Nordén and M. A. Pekkanen	3359	A coordinate transformation for mass transfer calculations
D. Barnea and Y. Taitel	3367	Nonlinear stability and dynamic simulation of annular flow
H. Hofmann and J. Bridgwater	3373	Editorial statement
M. P. Duduković and Y. B. Yang	3375	Solution of moving boundary problems for gas-solid noncatalytic reactions by orthogonal collocation—revisited
		<i>Shorter Communications</i>
D. D. Perlmutter and B. Scrosati	3381	A thin-film model for diffusion-controlled electrochemical doping of polymers
R. E. Valdés-Pérez	3384	A correspondence between reaction network equilibria and Boolean functions
	3387	Corrigendum

Number 12

R. L. Wu, J. R. Grace and C. J. Lim	3389	A model for heat transfer in circulating fluidized beds
G. Astarita and R. Occone	3399	Continuous lumping in a maximum-mixedness reactor
J. Benitez-Garcia, G. Ruiz-Ibanez, A. Bidarian and O. C. Sandall	3407	Kinetics of the reaction between carbon dioxide and triethylamine in aqueous solutions
D. Bonvin and D. W. T. Rippin	3417	Target factor analysis for the identification of stoichiometric models
A. Irabien, F. Cortabitarte, J. Viguri and M. I. Ortiz	3427	Kinetic model for desulfurization at low temperatures using calcium hydroxide

L. Gradoń and A. Podgórski	3435	Flexible fibrous particle behaviour in the carrier gas flow around cylindrical obstacle
E. J. Westerink, N. Koster and K. R. Westerterp	3443	The choice between cooled tubular reactor models: analysis of the hot spot
S. Rohani and J. R. Bourne	3457	Self-tuning control of crystal size distribution in a cooling batch crystallizer
S. Park and W. F. Ramirez	3467	Optimal regulatory control of bioreactor nutrient concentration incorporating system identification
F. Wassmuth, W. G. Laidlaw and D. A. Coombe	3483	Interfacial instabilities: the Linde instability
T. Tobin, R. Muralidhar, H. Wright and D. Ramkrishna	3491	Determination of coalescence frequencies in liquid-liquid dispersions: effect of drop size dependence
P. Psarris and C. A. Floudas	3505	Improving dynamic operability in MIMO systems with time delays
P. A. Ramachandran	3525	Diffusion-reaction problem revisited via a new boundary element discretization
T. O. Odi and I. A. Karimi	3533	A general stochastic model for intermediate storage in noncontinuous processes
M. Masi, S. Carrà, M. Morbidelli, V. Scaravaggi and F. Preti	3551	Monodimensional model of cold-wall reactors for epitaxial silicon chemical vapor deposition
J. Vohradský and H. Sovová	3563	Measurement of local velocities of drops in a liquid-liquid extraction vibrating plate column
R. O. Fox, W. D. Curtis and K. Halasi	3571	Linear stability analysis of the unsteady-state IEM model of micromixing
A. Cingara, M. Jovanovic and M. Mitrovic	3585	Analytical first-order dynamic model of binary distillation column
		<i>Shorter Communication</i>
S. P. Godbole, A. Schumpe and Y. T. Shah	3593	The effect of solid wettability on gas-liquid mass transfer in a slurry bubble column